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# TAX REFORM ON THE BRINK OF FISCAL DOMINANCE:

# A POLITICAL ECONOMY MODEL

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## 1. INTRODUCTION

With an overindebted public-sector, Brazil has been on the brink of a fiscal dominance problem for quite a long time. The term has been usually associated to a situation in which monetary policy becomes subordinated to fiscal needs. This paper calls attention to broader implications of prolonged exposure to impending fiscal dominance. A high-debt environment may make perfectly reasonable fiscal-reform initiatives seem extremely risky. Without any room to absorb revenue losses, in a complex fiscal-federalism arrangement, the government is bound to recurrently see badly needed tax reform, which could lead to a much less distorting tax system, as an unaffordable adventure.

The paper is structured in the following way. The next section presents stylized facts that have been underlying a whole decade of unsuccessful tax-reform attempts in Brazil. Section 3 shows how the combination of those facts creates very unfavorable conditions for the approval of the kind of tax reform the country needs. A simple political economy model is developed in section 4. Simulations based on the model are analyzed in sections 5 and 6. Concluding remarks are presented in the last section.

## 2. STYLIZED FACTS

There is a widespread feeling in Brazil that, once again, a good opportunity to carry on a thorough and much needed tax reform has been lost. This time, by the Lula government. After a decade of supposedly reformist resolution in that area, very little was in fact achieved. In hindsight, there seems to be important common facts that cut across the various unsuccessful tax-reform attempts observed over the period. The conjunction of those facts appears to be hampering the required collective action that could turn the reform feasible and to be giving way to what at first sight seems to be simply a deplorable conformism. From a careful analysis of how little was really accomplished by the convoluted tax-reform efforts observed in the country since the mid-nineties, five crucial facts seem to stand out.

*Abstract objective*

Since 1997, at least, the debate on tax reform in the country has been dominated by the concern with the irrationality of the tax system. The consensual view has been that the required reform should be able to make the tax system less complex, less inefficient and less obstructive of economic growth, without altering either the tax burden or the shares of three government levels in the aggregate tax revenue. There may be good reasons to try to conduct an efficiency-enhancing tax reform in Brazil along these lines, but one has to recognize that such reform has an extremely abstract objective. It is not something that can galvanize the electorate. In fact, there are good reasons to believe that that objective has not even been well understood by a large part of the country's political elite.

*Remote benefits*

Even among those that are perfectly able to grasp the importance of rationalizing the tax system, the dominant view is that benefits of a reform focused on such objective, substantial as they may be, will only be strongly felt after a number of years. Especially, of course, if the reform contemplates a slow phasing in of the involved changes.

*Virtues of old taxes*

Part of the most influential opinions about tax reform come from the elite of the tax collecting bureaucracy (at the three government levels), tax lawyers and members of the Judiciary, who are all prone to defend the idea that the good tax is the old tax. Collecting an old tax would always be far less problematic than trying to collect a new one. In its unabated defense of the *status quo*, that segment of the public opinion is invariably ready to try to sink any reform proposal with a barrage of worrying presages of endless judicial litigations.

*The reform is only feasible in the first year of the presidential term*

Tax reform is seen as a complex challenge that can only be successfully faced in the first of the four years of the presidential term. In the second year, there are municipal

elections. In the last, it is unthinkable. In the third, amid the political mobilization for the general elections of the fouth year, it is definitely too late.

*Revenue-loss risk*

Last but not least, there has been much uneasiness about the possible fiscal costs of a reform. With all government levels facing a hard-budget constraint, there is a great fear of revenue loss. A fear that affects not only mayors and governors but the central government itself. Only sizable changes in the tax system would be able to assure substantial efficiency gains. But bolder changes entail higher risk of considerable revenue loss. Of course, the reform could include an agreement on compensation rules within the federation. Yet the fear persists. Who can assure those rules will not be changed in the future?

## 3. TAX REFORM AND UNCERTAINTY

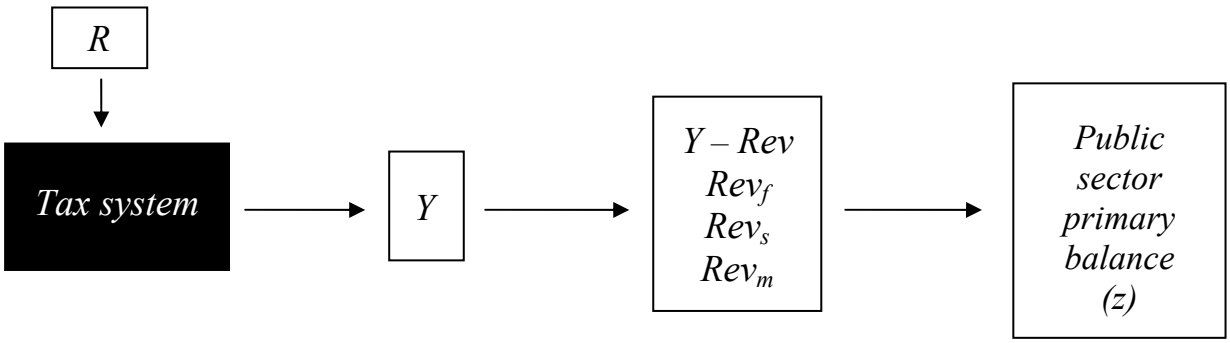
Those facts seem to establish very unfavorable conditions for the approval of the kind of tax reform the country needs. An important reform that can really make a difference in terms of efficiency gains requires some degree of boldness. But the bolder the reform, the higher the risk of revenue losses. Apprehensions with possible losses tend to be exacerbated by prophecies of overwhelming waves of judicial injunctions brandished by defenders of the virtues of old taxes. Having in mind their hard-budget constraints, governors and mayors tend to oppose bolder changes, unless they can be assured of full compensation of any losses by the Union. The federal government, having to face its own risk of revenue loss, has to decide whether such compensation can be really assured. It may also fear that if the Pandora box of a bold tax reform is opened, subnational governments may size the opportunity to extract from Congress a more generous piece of the aggregate tax revenue pie. For one reason or the other, the federal government has to decide whether it can stand the costs of having to keep a more precarious fiscal stance. Given the public-sector`s overindebtedness, the generation of sizable primary surpluses on a steady basis has become a crucial condition to bring down real interest rates and put the economy on a sustainable expansion path. With the government strongly pressed to deliver economic growth, the

idea of abandoning a sound fiscal position to bet on a risky tax reform may not sound very attractive. Economic benefits seem remote and there is no possibility of getting strong popular support out of a reform with such abstract objectives. Particularly when the next election seems so near.

Figure 3.1 presents a diagram that helps to visualize how the tax reform may be an important source of uncertainty about the public-sector primary balance. Assume that the degree of boldness of the tax reform is measured by *R*. The bolder the efficiency-enhancing tax reform (the greater *R*), the more drastic will be the required changes in the tax system applied to the aggregate output *Y*. The more drastic the changes, the higher the uncertainty over the aggregate tax revenue (*Rev*) and over how it will be split among the three government levels (federal, state and municipal) and, therefore, the higher the uncertainty on the overall public-sector primary balance (*z*).

*Figure 3.1*

*Tax Reform, Federalism and Uncertainty over the Public-Sector Primary Balance*



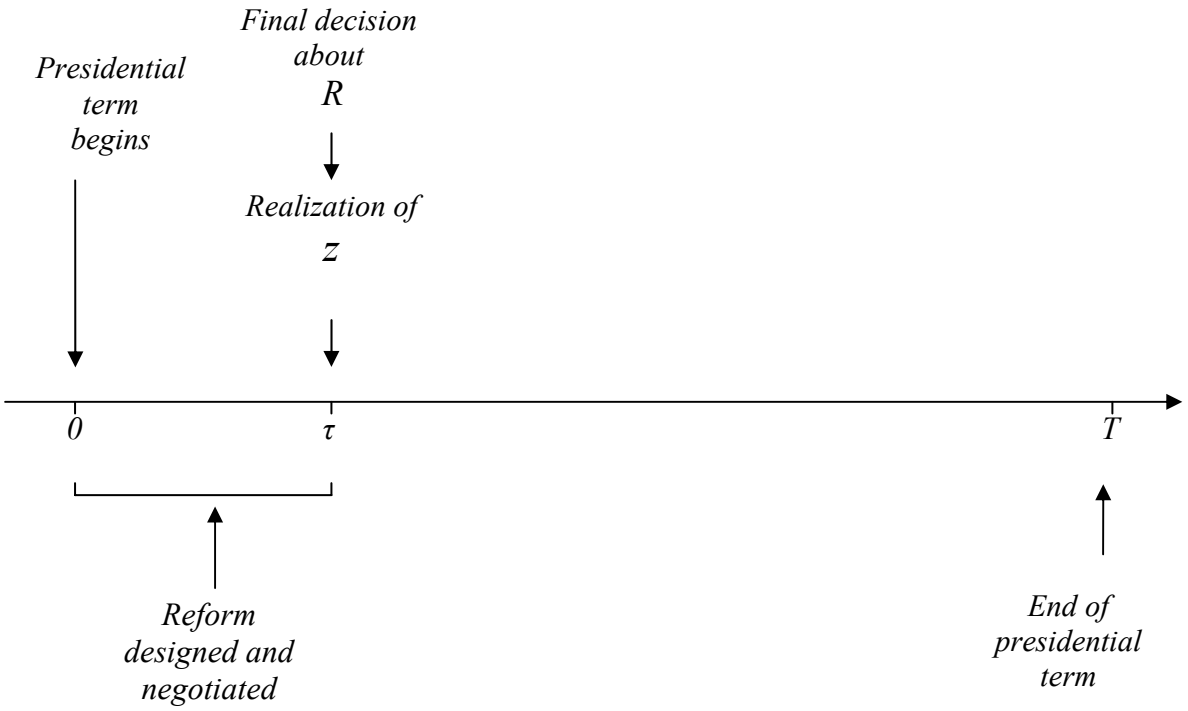

To take account of such effects and to better understand how they may influence government's decisions about the tax reform, a simple political economy model is developed in the next section.

## 4. A POLITICAL ECONOMY MODEL

In a discrete-time economy, consider the timing of events shown in Figure 4.1. The presidential term starts in $t = 0$. Sometime later, in a predetermined time $t = \tau$, the government concludes the political negotiation of the tax reform, and takes a decision on how bold the reform will be. In the model, that decision amounts to choosing a value for $R$, that measures the degree of boldness of the tax reform. The immediate implementation of such reform triggers the realization of $z$, the public-sector primary balance. The value of $z$ is kept unchanged till the end of the presidential term, in $t = T$.

*Figure 4.1*

*Timing of Events*




The standard linearized debt-dynamics equation for this economy may be written as

$$b_t = (1 + i_t - y_t)\, b_{t-1} - z \qquad [1]$$

where $b_t$ is the public-sector debt and $z$ the primary balance, both measured as a proportion of the aggregate product. The real interest rate is given by $i_t$ and the economy's growth rate by $y_t$ .

A heavier public-sector indebtedness leads to a higher real interest rate, as assumed in the constant-elasticity function

$$i_t = \alpha\ (b_{t-1})^{\eta} \qquad [2]$$

Presuming there is substantial excess capacity, the economy's growth rate $y_t$ is expressed as

$$y_t = \nu + \lambda R - \kappa i_{t-1} - \gamma z \qquad [3]$$

where it is shown to be negatively affected by both the real interest rate and the primary balance, and positively affected by $R$, that measures the degree of boldness of the tax reform. Without any loss of generality, it is assumed that $R$ is restricted to the interval [0 , 1] and that $R = 0$ means no reform.

The primary balance is supposed to be drawn from a known distribution $f$ , with mean $\mu_z$ and standard deviation $\sigma_z$

$$z \sim f(z \mid \mu_z\ ,\ \sigma_z) \qquad [4]$$

In order to take into account the premise that a bolder tax-reform brings greater uncertainty over the primary balance, the standard deviation $\sigma_z$ is assumed for simplicity to be

$$\sigma_z = \varphi R \qquad [5]$$

Decision on $R$ involves the maximization of the government's objective function, written as

$$W(R) = E\{\sum_{\tau}^{T} \beta_t U[Y_t(R)]\} \qquad [6]$$

where $\beta_t$ is a discount factor and

$$Y_t = (1 - y_t)\, Y_{t-1} \qquad [7]$$

is the level of aggregate product. What is assumed is that government is basically concerned with the growth performance of the economy. It chooses the value of $R$ that maximizes the expected present discounted utility of aggregate output, over the remaining part of the presidential term, after period $\tau$, when the decision on $R$ is finally taken.

## 5. SIMULATIONS

In order to run simulations and to develop a feeling for the possible magnitude of the involved effects, $R$ was initially set to zero and plausible values were assigned to parameters and predetermined variables, having in mind the situation of the Brazilian economy in the end of 2003. Presuming that $z$, the public-sector primary balance, would remain unchanged at 0.0425, the model was calibrated in such a way as to make the system formed by the first three equations simulate acceptable paths for $b_t$ , $i_t$ and $y_t$ . More precisely, to simulate paths for the three variables that would be considered, in late 2003, a reasonably probable macroeconomic scenario for the remaining 12 quarters of presidential term the Lula government still had at that point: a virtuous circle of slowly decreasing public-sector indebtedness, falling interest rates and moderate growth resumption.

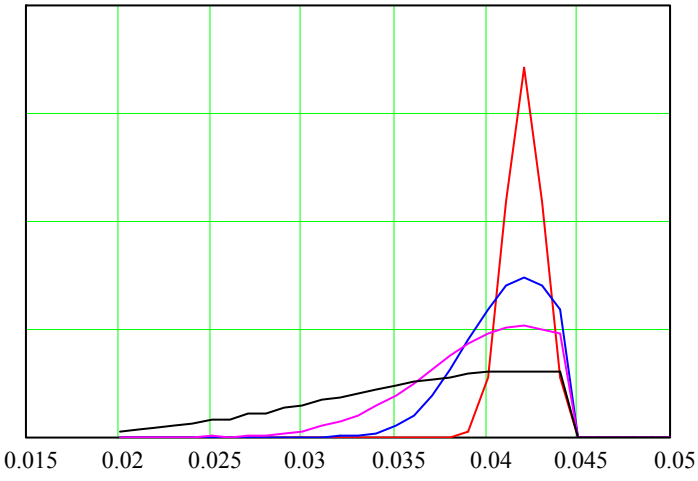
As mentioned above, the range of variation of $R$ was constrained to [0 , 1], the boldest kind of reform corresponding to $R = 1$ and no reform to $R = 0$. The parameter $\lambda$ in

equation [3] was calibrated accordingly. The distribution *f*, from which *z* is drawn, was assumed to be a truncated normal distribution with mean 0.0425, minimum value 0.02 and maximum value 0.045. As for the standard deviation, the assumption that $\varphi = 0.01$ in equation [5] made $\sigma_z = 0.01\ R$. Given the range of *R*, that means that $\sigma_z$ was allowed to assume values between zero and 0.01.

For each value attributed to *R*, Monte Carlo simulations, based on a distribution with the corresponding $\sigma_z(R)$ determined by equation [5], were run. Figure 5.1 presents distributions of the public-sector primary balance *z*, obtained from four different values attributed to *R*. The less dispersed one corresponds to *R* =0.1 and the most dispersed to *R* = 1.0. The other two were generated making *R* equal to 0.3 and 0.5.

*Figure 5.1*

*Distribution of z for Different Values of R*

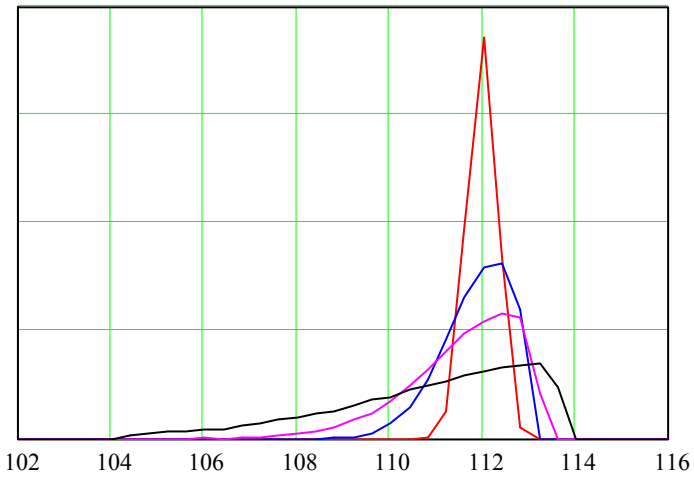



For each value of *z* drawn from a distribution obtained from a given *R*, the system formed by the first three equations was solved, and the resulting $y_t$ plugged in equation [7] in order to get the values of $Y_t$ to be inserted in the objective function [6]. When this process reached the last draw of *z*, the value of *W(R)* in [6] was computed. As that routine was repeated for different values of *R*, spaced over its whole range, *W(R)* could be plotted and the optimal value of *R* determined.

Figure 5.2 shows a clear picture of how expected macroeconomic performance over the considered period could be affected by the choice of $R$. It presents four distributions of the level of aggregate output $Y_t$ in the last quarter of the presidential term, generated by the model from the same four distributions of $z$ shown in Figure 5.1. (It was assumed that $Y_0 = 100$). The higher the value of $R$ the greater the uncertainty about the expected level of $Y_t$ in the end period.

*Figure 5.2*

*Distribution of the Level of the Aggregate Output in the End Period*

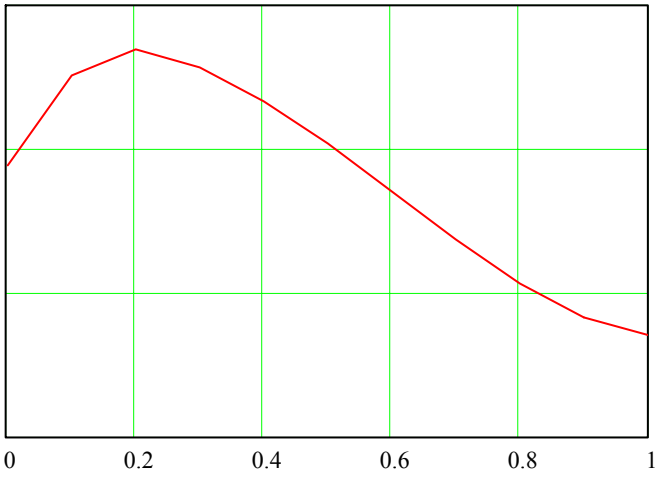



Assuming risk-aversion, a simple constant-elasticity specification for $U(Y)$ was used in the government's objective function given by equation [6]. The plot of the resulting objective function $W(R)$, generated by the model as different values were attributed to $R$, is presented in Figure 5.3.

The optimal $R$ value is relatively small, implying that the chosen reform would be marked by a low degree of boldness.

*Figure 5.3*

*The Government's Objective Function*



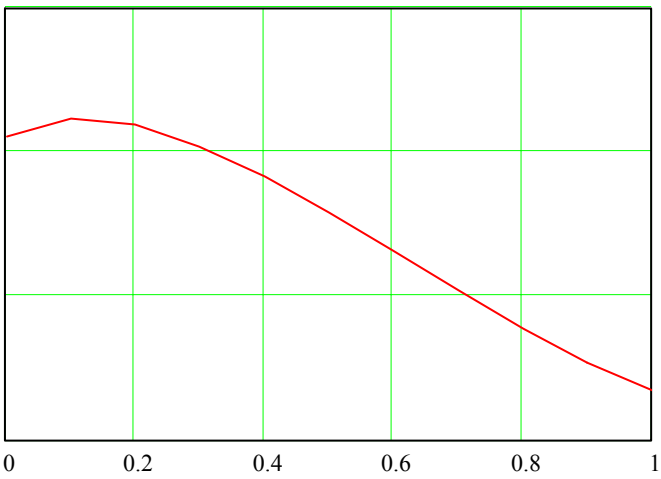

An alternative specification for the objective function [6] was also used. Instead of assuming that the government would maximize the expected present discounted utility of aggregate output over the remaining part of the presidential term, it was simply assumed that the government would maximize the expected utility of the total growth of the economy over that same period. That amounts to write the modified objective function as

$$W_M(R) = E\{U[Y_T(R) - Y_\tau]\} \qquad [7]$$

The plot of the modified objective function, generated by the model as different values were attributed to R is shown in Figure 5.4. Again, the obtained optimal *R* value is relatively small.

*Figure 5.4*

*The Government's Modified Objective Function*




## 6. Sensitivity Analysis

It is interesting to explore the sensitivity of the simulation results to values attributed to the two parameters directly related to the variable $R$ in the model. They are the main determinants of the trade-off involved in the government's decision. The first of them is $\varphi$, which determines how $R$ affects the standard deviation of the primary balance $z$ in equation [5]. It measures to which extent a bolder reform would make the primary balance more uncertain. In the simulations discussed above it was assumed that $\varphi$ = 0.01. Given that $R$ was constrained to [0 , 1], that assumption ultimately meant letting $\sigma_z$ assume values between zero and 0.01. Figure 6.1 shows the sensitivity of the optimal value of $R$ to $\varphi$, for each of the two objective functions considered. When $W(R)$ is used as objective function, if $\varphi$ is reduced to 0.0075, the optimal value of $R$ increases 0.4. Lowering $\varphi$ to 0.0066 is enough to make the optimal value of $R$ jump to 1.0, the boldest degree of tax reform. However, when $W_M(R)$ is used as objective function, $\varphi$ would have to be brought down to as low as 0.003 to make the optimal $R$ value reach 1.0. But, as may be seen in the chart on the right-hand side of Figure 6.1, the optimal value of R increases steadily as $\varphi$ is reduced from 0.1 to 0.03.

*Figure 6.1*

*Sensitivity of the optimal value of R to φ*

| *When W(R) is used as objective function* | *When $W_M(R)$ is used as objective function* |
|---|---|

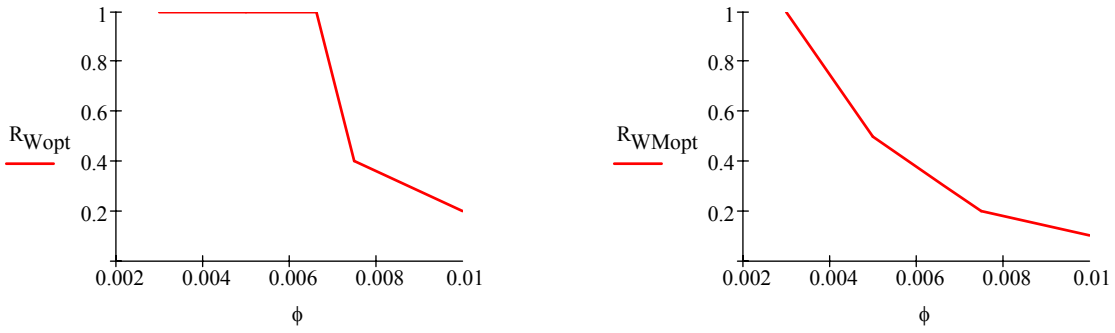
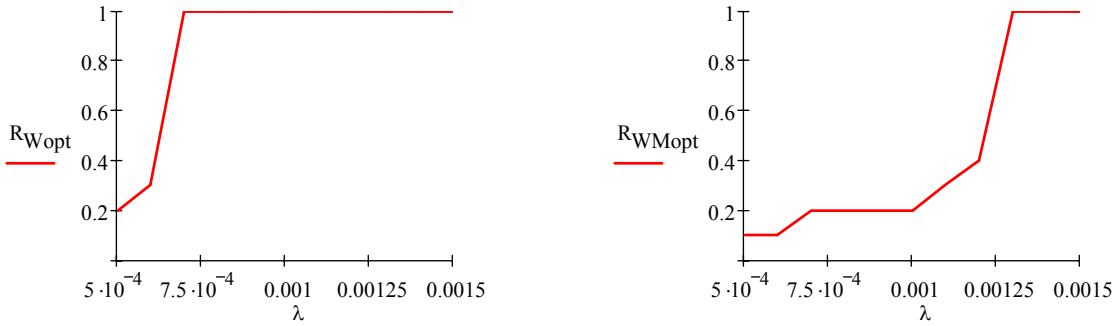



*Figure 6.2*

*Sensitivity of the optimal value of R to λ*

| *When W(R) is used as objective function* | *When $W_M(R)$ is used as objective function* |
|---|---|



The other parameter to be considered is $\lambda$, which determines the intensity of the positive effect of $R$ on the economy's quarterly growth rate $y_t$ in equation [3]. In the simulations discussed above, $\lambda$ was assumed to be equal to 0.0005, implying that the boldest tax reform ($R = 1$) would add approximately 0.2 percentage point to the annual growth rate of each of the last three years of the presidential term. Of course, the stronger the assumed effect of $R$ on $y_t$ the bolder the tax reform will tend to be. Figure 6.2 shows how the optimal value of $R$ increases as the value attributed to $\lambda$ is raised, for each of the two objective functions considered. When $W(R)$ is used as objective function, the optimal value of $R$ increases to 0.3 if $\lambda$ is raised to 0.006, and jumps to 1.0 if $\lambda$ is raised still further to 0.007. But when $W_M(R)$ is used as objective function, the optimal value shows to be well less sensitive to $\lambda$, as may be seen in the right-hand chart of Figure 6.2. The value attributed to $\lambda$ would have to be raised to 0.0013 to make the optimal value reach 1.0. Such a high value of $\lambda$ would mean to presume that the boldest tax reform could add more than half percentage point to the annual growth rate of each of the last three years of the presidential term.

## 7. Concluding Remarks

It goes without saying that the model has a clear message. A tax reform will have a better chance of being carried out the stronger its immediate direct impact on economic growth and the more limited the uncertainty it casts on the public-sector's primary balance.

The analysis developed above is no more than a first attempt to model an intriguingly complex political economy problem. There are many extensions to be explored. The idea that the uncertainty entailed by the tax reform may lead to a worryingly smaller primary surplus could be modeled in a more elaborated way. Instead of simply assuming, that, after the realization of $z$, the primary surplus remains unchanged for the rest of the presidential term, as established in section 4, the model could allow for a gradual recovery of the surplus in the same presidential term. Of course the recovery

would involve time and political costs and economic growth would be harmed while the primary surplus remained below the mark.

Allowing for the possibility of re-election would also turn the model more realistic. In principle, a longer time horizon to reap the benefits of the tax reform could make the government fight for a bolder reform. But, of course, to be able to be re-elected the government would still have to consider the uncertain effects of the tax reform on economic growth over the first presidential term. An interesting possibility to be explored would involve decision on a reform to be approved in a given presidential term and phased in only in the following one.

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